What is claimed is:

Sub B1

1. A method to enhance long-term memory in a subject whose cAMP-responsive gene expression is repressed due to binding of a cAMP-response-element-binding-protein-2 to a protein or a DNA associated with cAMP-responsive gene expression, or both, which comprises administering to the subject a compound capable of interfering with such binding in an amount effective to interfere with binding of the protein or the DNA so as to thereby derepress cAMP-responsive gene expression in the subject and enhance the subject's long-term memory.

2. The method of claim 1, wherein the compound is an anti-cAMP-response-element-binding-protein-2 antibody.

3. The method of claim 1, wherein the compound is capable of altering phosphorylation of the cAMP-response-element-binding-protein-2.

Sub B2

4. The method of claim 1, wherein the compound is an organic compound, a peptide, a peptide mimetic, a small molecule, or a nucleic acid.

5. The method of claim 1, wherein the protein associated with cAMP-responsive gene expression comprises a cAMP-response-element-binding-protein-1, a C/EBP protein, an Aplysia ApC/EBP protein, a human C/EBPβ protein, an AF-1 protein, a c-jun protein, a fla protein, or a c-Fos protein.

6. The method of claim 1, wherein the administration comprises intralesional, intramuscular or intravenous

injection; infusion; liposome mediated delivery; viral infection; gene bombardment; topical, nasal, oral, anal, ocular, cerebro-spinal, or otic delivery.

7. A method for evaluating the ability of a compound to interfere with binding of a cAMP-response-element-binding-protein-2 to a protein associated with cAMP-responsive gene expression in a cell which comprises:

(a) contacting the cell with the compound under suitable cell culture conditions;

(b) measuring the amount of unbound protein associated with cAMP-responsive gene expression in the cell;

(c) comparing the amount in step (b) with the amount of unbound protein associated with cAMP-responsive gene expression in the absence of the compound, so as to thereby evaluate the ability of the compound to interfere with binding of the cAMP-response-element-binding-protein-2 to the protein.

8. The method of claim 7, wherein the compound is an anti-cAMP-response-element-binding-protein-2 antibody.

9. The method of claim 7, wherein the compound is capable of altering phosphorylation of the cAMP-response-element-binding-protein-2.

10. The method of claim 7, wherein the compound is an organic compound, a peptide, a peptide mimetic, a small molecule, or a nucleic acid.

11. A method for evaluating the ability of a compound to interfere with binding of a cAMP-response-element-binding-protein-2 to a DNA associated with cAMP-responsive gene expression in a cell which comprises:

(a) contacting the cell with the compound under suitable cell culture conditions;

(b) measuring the amount of unbound DNA associated with cAMP-responsive gene expression in the cell;

(c) comparing the amount in step (b) with the amount of unbound DNA associated with cAMP-responsive gene expression in the absence of the compound, so as to thereby evaluate the ability of the compound to interfere with binding of the cAMP-response-element-binding-protein-2 to the DNA.

12. The method of claim 11, wherein the compound is an anti-cAMP-response-element-binding-protein-2 antibody.

13. The method of claim 11, wherein the compound is capable of altering phosphorylation of the cAMP-response-element-binding-protein-2.

14. The method of claim 11, wherein the compound is an organic compound, a peptide, a peptide mimetic, a small molecule, or a nucleic acid.

Sub B3

15. A method for treating a subject with a long-term memory defect due to binding of a cAMP-response-element-binding-protein-2 to a protein or a DNA associated with cAMP-responsive gene expression, or both, which

comprises administering to the subject a compound capable of interfering with such binding in an amount effective to interfere with the binding of the protein or the DNA so as to thereby treat the subject's long-term memory defect.

16. The method of claim 15, wherein the long-term memory defect comprises age-related memory loss, Alzheimer's Disease, amnesia, ischemia, shock, head trauma, neuronal injury, neuronal toxicity, neuronal degradation, Parkinson's disease, or senility.

17. The method of claim 15, wherein the compound is an anti-cAMP-response-element-binding-protein-2 antibody.

18. The method of claim 15, wherein the compound is capable of altering phosphorylation of the cAMP-response-element-binding-protein-2.

19. The method of claim 15, wherein the compound is an organic compound, a peptide, a peptide mimetic, a small molecule, or a nucleic acid.

20. The method of claim 15, wherein the protein comprises a cAMP-response-element-binding-protein-1, a C/EBP protein, an Aplysia ApC/EBP protein, a human C/EBPβ protein, an AF-1 protein, a c-jun protein, a fla protein, or a c-Fos protein.

21. The method of claim 15, wherein the cAMP-response-element-binding-protein-2 is human CREB2 transcription factor, murine ATF4 transcription factor, or Aplysia ApCREB2 transcription factor.

Sub B5

22. The method of claim 15, wherein the administration comprises intralesional, intramuscular or intravenous injection; infusion; liposome mediated delivery; viral infection; gene bombardment; topical, nasal, oral, anal, ocular, cerebro-spinal, or otic delivery.

23. A recombinant eukaryotic cell comprising a DNA encoding a cAMP-response-element-binding-protein-2 not naturally present in the cell, operatively linked to a promoter capable of directed enhanced expression of the DNA, the DNA and the promoter being stably integrated into the genome of the eukaryotic cell.

24. A transgenic, non-human mammal whose somatic and germ cells contain and express a DNA encoding a cAMP-response-element-binding-protein-2 not naturally occurring in the non-human mammal, operatively linked to a promoter capable of directed enhanced expression of the DNA, the DNA and the promoter being stably integrated into the genome of the non-human mammal.

25. A pharmaceutical composition which comprises an effective amount of a compound capable of interfering with binding of a cAMP-response-element-binding-protein-2 to a protein associated with cAMP-responsive gene expression in a cell and a pharmaceutically acceptable carrier.

26. The pharmaceutical composition of claim 25, wherein the carrier is a diluent, an aerosol, a topical carrier, an aqueous solution, a nonaqueous solution, or a solid carrier.

27. The pharmaceutical composition of claim 25, wherein the carrier comprises an appropriate adjuvant, a herpes virus, a liposome, a microencapsule, a neuronal cell receptor ligand, a neuronal-specific virus, a polymer encapsulated cell, or a retroviral vector.

Add C2